

## ABSTRACT

A data communications link for use in local area network (LAN) and shorter metropolitan area network (MAN) applications is described, comprising a single-transverse-mode, multiple-longitudinal-mode, long-wavelength optical source and a single-mode optical fiber. Advantageously, single-transverse-mode power can be enhanced when two or more longitudinal modes are present. Moreover, the optical source becomes more thermally robust, because lateral shifts in its active region gain curve will have less effect on the overall transmitted power when two or more longitudinal modes are present. Moreover, very high data transmission rates can be achieved because modal dispersion, attenuation, and chromatic dispersion are not limiting factors. A long-cavity vertical cavity surface emitting laser (VCSEL) structure capable of single-transverse-mode, multiple-longitudinal-mode, long-wavelength operation is described. The described VCSEL is amenable to a single-growth fabrication process. Enhanced VCSEL operation using curved distributed Bragg reflector (DBR) mirrors is also described.